SUPERNOVA ENVIRONMENTS IN HUBBLE SPACE TELESCOPE IMAGES

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The locations of supernovae in the local stellar and gaseous environment in galaxies contain important clues to their progenitor stars. Access to this information, however, has been hampered by the limited resolution achieved by ground-based observations. High spatial resolution Hubble Space Telescope (HST) images of galaxy fields in which supernovae had been observed can improve the situation considerably. We have examined the immediate environments of a few dozen supernovae using archival post-refurbishment HST images. Although our analysis is limited due to signal-to-noise ratio and filter bandpass considerations, the images allow us for the first time to resolve individual stars in, and to derive detailed color-magnitude diagrams for, several environments. We are able to place more rigorous constraints on the masses of these supernovae. A search was made for late-time emission from supernovae in the archival images, and for the progenitor stars in presupernova images of the host galaxies. In particular, we highlight the results for the Type II SN 1979C in M100. In addition, we have identified the progenitor of the Type IIn SN 1997bs in NGC 3627. We also add to the statistical inferences that can be made from studying the association of SNe with recent star-forming regions.